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Proceedings of the RAP Meeting on Eastern Beaufort Sea Beluga

29-30 March, 2000
Eskimo Inn, Inuvik, N.W.T.

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Abstract

The Regional Advisory Process (RAP) meeting on the status of eastern Beaufort Sea beluga was held in Inuvik on March 29 and 30, 2000. Participants included personnel from: DFO Science, DFO Oceans, Fisheries Joint Management Committee (FJMC); the Hunters and Trappers Committees (HTCs) of Aklavik, Inuvik, Paulatuk and Tuktoyaktuk; Joint Secretariat; and E.M.C. Eco Marine Corp. The draft Stock Status Report (SSR) was tabled for review along with drafts of two Working Papers. These were distributed prior to the meeting.

Particular attention was focused on the issue of stock abundance. It was generally agreed that aerial surveys provide only a partial estimate of the actual stock size. Based on the amount of data available and current level of analysis, application of correction factors to survey estimates, to account for animals below visible depth as well as those outside the survey area, was considered premature. There was little available data to comment on stock trend. It was noted that the age structure and sex ratio of harvested animals did not indicate any sign of change in stock size. Although sustainable harvest could not be calculated without a true estimate of actual stock size, stock abundance was considered sufficiently high that the known removal of animals from this stock in Canadian waters was well below the safe exploitation rate for beluga populations. In general, the outlook for the stock was considered good.

Sources of uncertainty relating to survey estimation, vital parameters, satellite tag data, and removal (in the non-Canadian portion of the stock's range) were discussed. Various management considerations and other considerations, including contaminants, disease and industrial development were identified. Resource users identified contaminants and disease, and their potential effect on the health of both belugas and humans, as a primary concern regarding this stock.

Résumé

La réunion du processus de consultation régionale (PCR) sur l'état des stocks de bélugas de l'Est de la mer de Beaufort s'est tenue à Inuvik les 29 et 30 mars 2000. Les représentants des organismes suivants ont assisté à cette réunion : MPO Science, MPO Océans, le Comité mixte de gestion de la pêche (CMGP), les comités de chasseurs et de trappeurs d'Aklavik, d'Inuvik, de Paulatuk et de Tuktoyaktuk, le Secrétariat commun et Eco Marine Corp. (EMC). La version provisoire du rapport sur l'état des stocks ainsi que les ébauches de deux documents de travail ont été soumises pour examen. Ces documents avaient été distribués avant la réunion.

La question de l'abondance du stock a fait l'objet d'une attention toute particulière. Il a été généralement convenu que les relevés aériens ne fournissent qu'une estimation partielle de l'ampleur réelle du stock. D'après la quantité de données disponibles et d'après les analyses menées actuellement, on a jugé qu'il était prématuré de rectifier les estimations des relevés en appliquant des facteurs de correction tenant compte des bélugas présents sous la couche de visibilité et de ceux qui se trouvent à l'extérieur des zones de relevé. En outre, l'insuffisance de données empêchait de formuler des commentaires au sujet des tendances du stock. Il a été mentionné que la structure par âge et le rapport des sexes des bélugas débarqués ne fournissaient aucun indice sur les variations du stock. Bien qu'il ne soit pas possible de calculer le taux durable de prises sans une estimation représentative de l'effectif réel du stock, il a été jugé que le stock était suffisamment abondant pour conclure que le nombre connu de prises de ce stock dans les eaux canadiennes était largement inférieur au taux d'exploitation sans danger des populations de bélugas. En général, il a été jugé que les perspectives de ce stock étaient favorables.

On a également discuté des incertitudes liées aux estimations provenant des relevés, aux paramètres biologiques, aux données de pistage par satellite et aux retraits (dans les zones de l'aire du stock à l'extérieur des eaux canadiennes). Diverses considérations liées à la gestion ont été identifiées, de même que des questions touchant notamment les contaminants, les maladies et le développement industriel. Les contaminants et les maladies ainsi que leurs éventuelles répercussions sur la santé des belugas et des humains ont constitué, pour les utilisateurs de ressources, les principaux motifs de préoccupation en ce qui a trait au stock de bélugas.

Introduction

The meeting came to order shortly after 9 a.m. on March 29, 2000. An opening prayer was given. RAP participants and observers introduced themselves. Persons attending the RAP meeting are listed in Annex 1. The co-chairs provided an overview of the Regional Advisory Process in the Central and Arctic region, the documents on the table for review, and the general principles for the meeting discussion.

It was noted that the author of the draft SSR could not be present until the afternoon session, due to a weather-related travel delay. It was agreed that any specific issues that could not be clarified or resolved sufficiently without the author's presence would be revisited after his arrival. Two other participants arrived for the afternoon session.

The agenda was reviewed and opened for discussion. Participants were invited to give general opening comments and to identify specific issues prior to approving the agenda. The issues of stock size and associated wording used in the SSR and the Background Document, were identified as concerns. It was generally agreed that references to estimates of stock numbers were stock indices, not realistic estimates of actual stock size, and that every reference to stock numbers or other parameters that are based on stock size estimates should take special care to use appropriate terminology and qualification.

The under-estimation of beluga numbers was illustrated by one participant's remarks about seeing vast numbers of beluga in Kugmallit Bay from shore, vastly greater than the then-current estimate of 7500 whales. Although stock-specific data are not yet available for eastern Beaufort Sea beluga (EBSB), some of the participants felt that correction factors for below-the-surface whales could be gleaned from the literature and applied to aerial survey results to derive a realistic estimate of stock size for EBSB. After discussion of some of the inherent problems of using indices of stock size in a public document, and applying corrections for bias, and after general acknowledgement of this issue as requiring further attention, discussion on this matter was reserved for later in the meeting.

The agenda was approved, taking into account that certain portions of the draft SSR would be reviewed out of sequence, due to editorial consideration (some portions of the report were identified by the co-chairs as belonging in other sections and some sections were missing from the draft). The remainder of this document presents the main elements of discussion on a section by section basis, in the general order of the agenda. In cases where the chronological discussion varied from the agenda, an attempt was made to coalesce the comments into the appropriate sections here.

Background

Minor additions and points of clarification to terminology were made to the text in this section. New wording was provided to describe the relevance of the Oceans Act and pending Marine Protected Area for the Mackenzie estuary. Other items of discussion included to the use and origin of the term "Inuvialuit".

Species Biology

It was identified that some of the information on species biology in this section was based on information from other stocks. It was felt that the database, much of it unpublished, should be carefully checked so as to include as much stock-specific information as possible. Specific parts of this task were assigned to individual participants to check/update. One of these cases was the juvenile age-length data. It was later determined that data from only two beluga from the EBSB stock were available that fell into the 2-5 year age range: a three year 224 cm male; and a four year female, 33? cm; thus the information from the other stock was retained. Life spans older than that described in the draft SSR were known for the EBSB stock, and that particular aspect could be updated.

It was generally acknowledged that population vital parameters that are intended to be described in this section are not available for this stock. Few vital parameters can be obtained from the hunter-based sampling program because of the inherent bias in the selection of adult animals in the hunt. However, some measures of female reproduction could be obtained from the sampling program such as age at sexual maturity, calving interval and calculated crude birth rate (percent of sexually mature females that are gravid), and it was suggested that these items might be useful indices for monitoring the reproductive performance of the stock.

In the section describing feeding, it was noted that the prey items listed applied to "beluga in general" and not the EBSB specifically. Local experience at the table reported observations of Arctic cisco, squid beaks, burbot and whitefish being consumed by beluga, and it was suggested these be added to the list. It was noted that, since harvested belugas usually have empty stomachs, it is difficult to say what the main diet of belugas is. Several prey items were suggested as belonging on the list of main diet items, and it was agreed that this section required editing and should include invertebrates.

Other points of clarification were suggested and adopted for the description of seasonal beluga movements, as known from traditional knowledge and satellite tagging studies. It was also pointed out that a number of place names in this section should be identified on the map.

The Hunt

There was some discussion of the struck and loss data. It was agreed that the struck and loss totals were needed to calculate overall removal but that the detailed, community-specific loss data need not be reported in the SSR.

The variability in harvest (landings) levels from year to year was discussed and the beluga hunters in the group felt strongly that this was due to variability in weather and ice conditions, as opposed to changes in wage earning opportunities.

There was also discussion about the techniques used to hunt whales in shallow water and deep water. It was generally agreed that belugas in shallow water are harpooned first before shooting, but this was less clear for deeper water, where in some cases it is necessary to wound the whale before being able to harpoon it.

It was also pointed out that, contrary to the statement that the largest whale in the pod is selected as the target animal, the more common adult sized whales ("average size") were usually targeted in the hunt.

It was identified that a section describing the season of the hunt was missing and that a Table which illustrated the numbers of landed animals for each community over time was also needed in the report. One participant agreed to provide this information to the author for inclusion in the SSR.

Resource User Perspective

A section with the title "Resource User Perspective" was missing from the draft SSR. Suggestions were invited for topics to be covered in this section. Text written by the author in an earlier draft of the SSR that appeared to address this perspective was tabled for possible inclusion and discussion. This text was revised and new text added based on the discussion that followed. It was also suggested that further text that might encapsulate the perspective of resource users might be found in a traditional knowledge study entitled "Harpoons and Ulus" by Byers and Roberts (1985). Two participants indicated that they would draft a paragraph that addressed this suggestion and it would be inserted into the revised draft SSR.

Community concerns regarding the stock and its use as food were discussed. A participant from one of the communities indicated that a major concern in the communities was that of contaminant loads and disease in the whales that are consumed. This participant reaffirmed that from a local perspective, this

concern was paramount and greater than any concern about stock numbers or other issues of stock status.

Resource Status

Stock Delineation

Minor additions and points of clarification were made to the text in this section. There was some discussion about the statement that belugas taken during the eastward spring movement past Point Hope, Alaska, were thought to be the same stock as those in the eastern Beaufort Sea. It was clarified that this did not mean that whales found in the vicinity of Point Hope later during the summer were of the same stock as those in the eastern Beaufort Sea, and in fact, they are different.

Stock Size

There was much discussion about the correct use of terminology in this section. It was suggested that this section would be subject to close scrutiny from the public and in particular, from environmental groups, who could potentially misuse the number published here. Some felt that because the survey estimates were strongly biased toward underestimating the stock size, it was of extreme importance not to use the terms "stock size" or "estimate of stock size" loosely, in this section or anywhere else in the document. In addition, the biases should be thoroughly identified and clearly stated.

Some felt that despite the use of a clearly qualified term in discussing whale numbers, any qualified estimate that was published would remain fixed as the actual estimate of stock numbers. It was further suggested that therefore, the correction factors from the dive data (available in the literature but based on satellite tagged whales from other stocks) should be applied to the survey estimates and the larger estimate presented (still qualified as an incomplete number, due to other biases) rather than the survey estimates. Application of a conservative estimate of the dive correction factor would at least double aerial survey estimates. It was indicated that a publication by E.I.A. (Environmental investigation Agency), an environmental protectionist group, used an estimate of stock size of 41,610, based on a correction factor of 2 to account for submerged animals. However, it was identified that this also would not be a complete stock size estimate, since it does not account for a significant proportion of animals which were outside the survey area. It was unclear what correction factor to apply for this unsurveyed area.

The amount of data from studies on dive times and long range movements from satellite tagged belugas for the EBSB stock was considered still relatively small and not yet sufficiently analyzed, to account for some of the unknowns and suspected biases that could influence the calculation of correction factors. It was unanimously agreed that: we do not have a complete estimate of stock size; that the area surveyed during aerial surveys represents only a portion of the the total summer range used by this stock (as indicated by movements of tagged belugas from this stock in years following the survey year); surveys did not account for animals which were beyond visible depth range.

Options for presenting the numbers were tabled. However, despite any application of correction factors, it was still clear that these were still indices and as such, become more uncertain as correction factors are added. Although there was no clear consensus on the number to use as the index for stock size, it was unanimous that any number used was just an index and should be presented as such. Terms of caution should be identified for those indulging in the application of correction factors and should be clearly stated in the SSR.

Stock Trend

A section with the title "Stock Trend" was missing from the draft SSR. It was agreed that there were no measurements on temporal trends in stock size and that comments to this effect should be clearly stated in this section. Counts from the most recent aerial survey, although greater than that from all

previous aerial surveys in this area, are not considered indicative of an increasing trend in the size of the stock. There were differences in survey coverage and design between 1992 and earlier studies, with the former having the largest coverage to date.

Sustainable Hunting Rate

It was agreed that the text in this section required revisions in order to clearly state that the calculated harvest rate was based on a percentage of the **index** of abundance and **not** on an actual estimate of stock size.

It was unanimously agreed that despite the number used to derive an estimate or index of removal rate, the removal rate was well below the safe removal rate for beluga populations. Wording to this effect was proposed and accepted.

Sources of Uncertainty

There was considerable discussion about sources of uncertainty that led to suggestions for additions and revisions of the drafted text. These were generally accepted and agreed to be incorporated into the SSR.

The uncertainty of stock size and the application of satellite tag correction factors was again discussed. The uncertainties of the proportion of animals outside the survey area, and the differences in tag data for the three years of tagging was examined. The observation that the animals tagged in the third year of the three-year study did not undergo the long-distance movements that occurred in the first two years was ascribed to the later date of tagging. It was suggested that more tagging work needs to be done to help determine future aerial survey coverage and to determine the importance of the deepwater habitat, which could be critical feeding habitat.

Although age-specific reproductive rates were not considered as parameters that could be obtained from the hunter-based sampling program, it was suggested that data on calving rates and female reproductive rates could be obtained. If incorporated into the sampling program, such date could provide valuable indices of reproductive performance of the stock. Reproductive rates are known to vary between years and also are influenced by the amount of hunting pressure exerted on a population.

It was suggested that the actual rate of removal from this stock based on harvest statistics is an underestimate, since the removal of animals while the stock is in Alaskan and Russian waters, is not known. While these additional removals are probably not high, it was suggested that data should be sought to determine their magnitude and trend.

With regard to uncertainties in temporal trends in levels of persistent organochloride contaminants and heavy metals, it was noted that studies are being planned to monitor these contaminants in the Beaufort Sea belugas beginning in summer 2000. Similarly, uncertainties about the incidence of viruses or other disease agents in Arctic whales or the importance of such factors, both to the animal populations and the human consumers, will be addressed through studies being planned to monitor these aspects in the Beaufort Sea belugas beginning in summer 2000. Text related to contaminants and disease was moved to the section "Other Considerations"

Outlook

It was identified that this section required revision in order to address the outlook for the stock. A new statement was drafted, which was accepted with minor discussion. The author was requested to revise this section to address more specifically the intention of this section.

Management Considerations

A section with the title "Management Considerations" was missing from the draft SSR. Comments from RAP participants were collected on a flipchart. These comments were used to focus discussion on the relevant topics for this section: the effect of an increasing human population, the implications of provisions for legal trade of beluga products, and the effect of tourism. Although hunting pressures were not thought to be on the increase, there was no consensus on the implications of other factors. It was suggested and generally agreed that the introduction of a marine protected area would provide a framework for ensuring compliance to guidelines. After general agreement about which items were appropriate for this section, it was suggested that this section be drafted for inclusion in the revised draft of the SSR.

Other Considerations

It was suggested by some that this section went into too much detail and could be condensed. It was suggested that the statements on contaminants and disease be given a global perspective, and that much of the discussion of these issues arising from studies of other species be removed.

Participants from the communities reiterated their concern about contaminants and disease. One participant indicated that this was the first report of *Brucella* in beluga whales that he had heard of. It was identified that a poster had gone out to all the Hunters and Trappers Organizations, and the FJMC, presenting results of a study on the incidence of *Brucella* in Arctic marine mammals. It was acknowledged that these had been received.

The concern about *Brucella* and the risk to human health was identified as a major concern to the resource users. It was suggested by one RAP participant that the study indicated only that antibodies were found, indicating that the animals had been exposed to, but do not necessarily carry *Brucella*, and thus the health risk should not be overstated. It was later determined that exposure to *Brucella* results in antibody production (positive serum titer) as well as life long infection with the bacterium. Although the documentation of this bacterium in beluga is relatively recent and the implications for human health by consuming beluga products is not well known, a risk to human health should not be ruled out.

In the section on industrial development, it was suggested that more importance should probably be given to the food chain effects of oil spills than the effects of physical immersion in or exposure to oil.

In the revision of this section of the SSR, the author added information on potential disturbance effects on beluga. He brought up the point that measuring disturbances to whales is not a simple task and interpreting the cumulative effect of such factors on belugas is extremely complex (Lesage *et al.* 1999). Recent technological developments and the ability to capture and place recording sensors on individual belugas could aid in these behavioral studies. It was suggested that some effort should be directed towards obtaining baseline comparative behavioral data before major developments are under way.

Additional text to indicate the potential impact of increased tourism was suggested to be included.

Ice entrapments, predation, climate change, the Russian take, and the possible legalization of the sale or trade in marine mammal parts, were identified as additional considerations to include somewhere in the SSR, either in this section or if more appropriate, under "Management Considerations".

General Discussion and Adjournment

The floor was opened for general discussion about the SSR and for suggestions on the section in the SSR entitled "Summary". It was unanimously acknowledged that the "Summary" would need to be completely revised to reflect the changes in the SSR. It was agreed that, due to the time remaining, this task would be left to the author after the RAP meeting. The meeting was adjourned after a short discussion of the schedule for revision and final review of the RAP documents.

Annex 1. Eastern Beaufort Sea Beluga RAP meeting – Proposed Agenda.

Wednesday, 29 March 2000	**Responsibility**
9:00 Opening Remarks and Introductions A brief description of the background to the Regional Advisory Process, the responsibilities of DFO, and intentions for the meeting	**Larry Dueck & Mike Papst**
9:15 Review and Adoption of Agenda	**Larry Dueck**
9:15 Introduction • Responsibilities of chairpersons, author, and RAP participants • SSR approval process and the outcome of the RAP • General approach for this review	**Larry Dueck & Mike Papst**
10:15 ***..... 15 minute break .....***	
10:30 Begin review of draft SSR according to Remit ➢ ***Background*** ➢ ***Species Biology***	**all**
12:00 ***..... lunch break .....***	
1:00 Continue review of draft SSR ➢ ***The Hunt*** ➢ ***Resource User Perspective***	**all**
3:00 ***..... 15 minute break .....***	
3:15 Continue review of draft SSR ➢ ***Resource Status*** ➢ ***Sources of Uncertainty*** ➢ ***Outlook***	**all**
5:00 Adjourn until 9:00 am	

Thursday, 30 March 2000	**Responsibility**
9:00 Continue review of draft SSR ➢ ***Management Considerations*** ➢ ***Other Considerations***	**all**
10:15 ***..... 15 minute break .....***	
10:30 Continue review of draft SSR ➢ ***Summary***	**all**
11:00 Final comments and general discussion	**all**
12:00 Meeting adjourned	

Annex 2. Participants List

Participants	Association
AVIUGANA, Donald	Aklavik HTC
BINDER, Richard	Inuvik HTC
DAY, Billy	Fisheries Joint Management Committee
DE MARCH, Brigitte	DFO Science, Winnipeg
DOWLER, Don	Fisheries Joint Management Committee
DUECK, Larry	DFO Science, Winnipeg
EMAGHOK, Lenny	Tuktoyaktuk HTC
GREEN, Ruben	Paulatuk HTC
HARWOOD, Lois	DFO Science, Inuvik
INNES, Stu	DFO Science, Winnipeg
KOTOKAK, Max	Fisheries Joint Management Committee
MATHIAS, Jack	DFO Oceans, Winnipeg
MCLEAN, Ed	Fisheries Joint Management Committee
PAPST, Mike	DFO Science, Winnipeg
ROGERS, Hank	Inuvik
SMITH, Tom	E.M.C. Eco Marine Corp., PQ
SNOW, Norm	Joint Secretariat, Inuvik

Observers	Association
HYSLOP, Colleen	DOE/CWS Ottawa
STEPHENSON, Sam	DFO Inuvik